REMARKS

I. Introduction

Receipt is acknowledged of the Non-Final Office Action dated June 2, 2003. Claims 1-33 and 38-48 were Canceled in Applicant's Preliminary Amendment filed August 7, 2001. Currently, claims 34-37 remain pending in the application. No new matter is added in the amendments, which are fully supported by the specification.

II. Claim Objections

The Examiner has objected to claims 35 and 37 because claims 35 and 37 do not recite biological species names in italics. The Examiner has objected to claims 36(i) and 37 because the claims recite incorrect spellings of "natural" and "Actinoplanes," respectively. These objections are rendered moot with the above amendments. Withdrawal of these objections is therefore respectfully requested.

III. Rejections under 35 USC § 112

A. Rejections Under 35 USC § 112, second paragraph

The Examiner has rejected claims 34 and 35 under § 112, second paragraph, as being indefinite for reciting the phrase "expressing DNA." In response, Applicants have amended claim 34, from which claim 35 depends, to read "transforming a host cell with a recombinant DNA molecule which comprises acarbose-synthesizing genes, and culturing said host cell under conditions such that said DNA molecule is expressed ...," in accordance with the Examiner's recommendation. Therefore, Applicants respectfully request withdrawal of this rejection.

The Examiner has rejected claims 36 and 37 under § 112, second paragraph, as being indefinite because it is not clear whether all of the host cell DNA is eliminated, or how, after elimination, either all of the host cell DNA, or elimination of only specific DNA sequences of the host cell leads to production of acarbose. The Examiner has also asserted that claim 36, from which claim 37 depends, is incomplete for omitting the essential step of transforming host cells with DNA responsible for acarbose biosynthesis. In response, Applicants have amended claim 36 to recite "eliminating or altering endogenous acarbose-synthesizing genes in a transformed, naturally-producing acarbose host cell; and, culturing said host cell under conditions such that the remaining genes are expressed, and acarbose is synthesized ... ." Support for this amendment can be found in the specification at page 3, lines 25-30. No new matter has been added by this amendment. In view of this amendment, Applicants request that the Examiner to withdraw this rejection.

B. Rejections Under 35 USC § 112, first paragraph

1. Enablement

The Examiner has rejected claims 34-37 under § 112, first paragraph, because the specification does not reasonably provide enablement for a method of producing acarbose by expressing one or more fragments of SEQ ID NO:7, or a process comprising isolating acarbose from the culture supernatants of the host cell in which all the native acarbose synthesizing genes are eliminated. The Examiner has also stated that it is not clear which of the SEQ ID NO:7 fragments is likely to be successful in synthesizing acarbose. The Examiner has stated that this would require undue experimentation, and the specification is limited to teaching a single species, SEQ. ID NO: 7, of the claimed genus.

Applicants note that Page 8, lines 2 and 3 of the specification refer to a recombinant DNA molecule to be used in acarbose production which comprises a DNA sequence according to Table 4, or parts thereof. Applicants also note that the description provided in the specification provides that not all of the genes are necessary for the biosynthesis of acarbose. For instance, page 12 of the specification says that

some regulatory genes, such as acbE, could be deleted or modified to increase the rate at which acarbose is synthesized, or to obtain purer forms of acarbose. Page 6, lines 4-8 of the specification also describe how deleting any of the acbBCD genes can cease the production of pseudo-oligosaccharides, such as acarbose. Pages 5-8 of the specification describe six such specific DNA fragments of SEQ ID NO:7 that can be eliminated or altered, their encoded genes, and their expected functions, such as the biosynthesis of acarbose. The encoded genes correspond to the following DNA sequences listed in Claims 34(iii) and 36(iii): acbA (nucleotides 1-720 of SEQ ID NO:7), acbB (nucleotides 720-2006 of SEQ ID NO:7), acbC (nucleotides 2268-3332 of SEQ ID NO:7), acbD (nucleotides 3332-4306 of SEQ ID NO:7) , acbE (nucleotides 4380-5414 of SEQ ID NO:7), and acbF (nucleotides 5676-6854 of SEQ ID NO:7). Such genes may be eliminated using vectors (Page 12, lines 8-9 of the specification).

Thus, in response to the Examiner's argument that the specification does not teach a process comprising isolating acarbose from the culture supernatants of the host cell in which all the native acarbose synthesizing genes are eliminated, Applicants have amended Claim 36 to recite "eliminating or altering endogenous acarbose-synthesizing genes in a transformed, naturally-producing acarbose host cell ... ." No new matter has been added by this amendment. In view of this amendment, Applicants request the Examiner to withdraw this rejection.

2. Written Description

The Examiner has rejected claims 34-37 under § 112, first paragraph, as allegedly lacking written description because the claims are directed to a method of making acarbose using/eliminating a genus of DNA molecules, and the genus includes all DNA sequences that are fragments of SEQ ID NO:7. The Examiner has asserted that the genus of DNAs that comprise these fragments is a large variable genus with the potentiality of encoding many different proteins, and that the specification discloses only a single species, SEQ ID NO:7, of the claimed genus. Applicants note, however, that the entire gene which encodes the biosynthesis of acarbose, or individual genes from this sequence, can be expressed to achieve an increase in, simplification of, or preparation of acarbose (page 3 of the specification, lines 25-30). The claims recite six

such specific fragments of SEQ ID NO:7 which are listed and described on page 8, lines 13-30 of the specification. When any of these gene fragments from SEQ ID NO:7 are eliminated or altered, (i.e., by knock-out or mutagenesis), the transcription-regulating proteins that the genes encode are regulated, and acarbose biosynthesis is affected (specification, page 6, lines 24-31).

Nevertheless, in response, Applicants have amended claims 34 and 36 to recite the nucleotide sequence of SEQ ID NO:7. Claim 36 has been amended to recite "isolating acarbose from said host cell; wherein said remaining genes alter the acarbose biosynthesis rate ... ." Support for this amendment can be found on page 3, line 38 to page 4, line 5 of the specification. No new matter has been added by this amendment. In view of this amendment, Applicants request the Examiner to withdraw these rejections.

IV. Sequence Compliance

The Examiner has stated that Applicants are not in compliance with the sequence rules because Applicants have not inserted the appropriate sequence identification numbers (SEQ ID NOs.) into the claims. In response, Applicants have amended claims 34 and 36 to recite the nucleotide sequence SEQ ID NO:7, where appropriate. In view of this amendment, Applicants request the Examiner to withdraw this rejection.

CONCLUSION

Applicants assert that all pending rejections should be withdrawn in view of the above amendments and remarks. An early notification of allowance is therefore respectfully requested, and the Examiner is invited to contact the undersigned attorney for Applicants for any reason related to the advancement of prosecution in this case.

Respectfully submitted,

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Date

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